AS Cont

44. A method according to claim 43, wherein the ends of said plurality of array-side optical fibers are cut by rotating a cylindrical edge of a cylindrical shape about a center axis of said virtual circle.--

REMARKS

Claims 2, 4 through 19 and 25 through 44 are now pending. Of these claims, claims 30 and 32 through 36 stand withdrawn from consideration. In response to the Office Action, dated September 3, 2002, claims 1, 3 and 20 through 24 have been cancelled, claims 2, 4, 5, 7, 11, 12, 15, 37, 40 and 41 have been amended, and claims 42 through 44 have been added. Care has been taken to avoid the introduction of new matter. Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE." Favorable reconsideration of the application as now amended in light of the following remarks is respectfully solicited.

The specification has been reviewed with no errors having been discovered therein.

Claims 5 through 10, 26, 27, 38 and 39 have been rejected under the second paragraph of 35 U.S.C. § 112 for indefiniteness. Statements of the rejection are set forth at pages 3-5 of the Office Action. The claims are purported to be indefinite for their recitation of base material having a prism shape while having fiber fixing grooves that extend along a radial direction of a virtual circle. It is submitted that, when the claims are read in light of the specification disclosure, the subject matter recited in these claims would readily be understood by a person of ordinary skill in the art, the claims thereby meeting the requirements of the statute.

Reasonable claim precision in light of the particular subject matter involved is all that is required by the second paragraph of 35 U.S.C. § 112. *Miles Laboratories, Inc. v. Shandon, Inc.*, 997 F.2d 870, 27 USPQ2d 1123 (Fed. Cir. 1993); *North American Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPQ2d 1333 (Fed. Cir. 1993); *U.S. v. Telectronics Inc.*, 857 F.2d 778, 8 USPQ2d 1217 (Fed. Cir. 1988); *Hybritech, Inc, v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 USPQ 81 (Fed. Cir. 1986). Claims must be interpreted through the eyes of one having ordinary skill in the art in light of and consistent with the supporting specification. *Miles Laboratories, Inc. v. Shandon, Inc., supra.*

The specification and drawings are replete with descriptions of a base member being of a prismatic shape while having fiber fixing grooves on at least one surface thereof that extend along radial directions of a virtual circle that is coincident with the surface. As only one example, reference is made to Fig. 9, described at page 47 *et seq.* of the specification. Relevant portions of the specification are found, for example, at page 48, line 12, page 49, line 18, page 49, line 17, etc. It is submitted that a person of ordinary skill in the art would have no difficulty in understanding the claim recitation. The prism shape refers to a three dimensional configuration having a plurality of sides. Fig. 9 illustrates such a structure having four sides. At least two of the side surfaces have grooves formed therein, the grooves of each surface aligned with a portion of a respective radius of a virtual circle coincident with the surface. As illustrated, two separate rotating means are provided. Arraying-member rotating device 15 rotates the prism about its axis to select the array-side fiber surface that is to face the optical fiber 4. Motor 18 causes rotation of the support 17a (for the optical fiber 4) about pivot shaft 18a. A complete rotation of the shaft would

circumscribe a virtual circle for any point at a fixed radial distance from the pivot point. The grooves in each surface of the prism extend along radial directions from the pivot.

While Fig. 9 illustrates a rectangular prism, other prisms are disclosed, such as the pyramid shown in Fig. 16. The fact that claims recite a prism shape rather than a specific rectangular or pyramid structure does not render the claims indefinite; rather, the recitation covers any structure conventionally recognized as a prism and which is not inconsistent with the disclosure. In summary, the issue raised in the center paragraph of page 3 of the Office Action pertains to the breadth of the limitation, not to indefiniteness. Withdrawal of the rejection under the second paragraph of 35 U.S.C. § 112 is solicited.

All claims considered in the Office Action have been rejected with respect to prior art under either 35 U.S.C. § 102(b) or 35 U.S.C. § 103(a). Eight prior art references have been relied upon, either singly or in various combinations.

Anticipation, under 35 U.S.C. § 102, requires that each element of a claim in issue be found, either expressly described or under principles of inherency, in a single prior art reference. *Kalman v. Kimberly-Clark Corp.,* 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983); *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 9 USPQ2d 1920 (Fed. Cir. 1989) *cert. denied,* 110 S.Ct. 154 (1989). The term "anticipation," in the sense of 35 U.S.C. § 102, has acquired an accepted definition meaning "the disclosure in the prior art of a thing substantially identical with the claimed invention." *In re Schaumann,* 572 F.2d 312, 197 USPQ 5 (CCPA 1978). The initial burden of establishing a basis for denying patentability to a claimed invention rests upon the examiner. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985); *In re Piasecki*, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984). To satisfy this

burden, therefore, each and every element recited by the claims so rejected must be shown by the examiner to be disclosed in the prior art reference relied upon.

In the application of a rejection for obviousness under 35 U.S.C. §103, the Office Action must provide a reason why one having ordinary skill in the art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 227 USPQ 657 (Fed. Cir. 1985). *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *In re Warner*, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967). It should be recognized that the fact that the prior art *could* be modified so as to result in the combination defined by the claims would not have made the modification obvious unless the prior art suggests the desirability of the modification. *In re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986). In the absence of such a prior art suggestion for modification of the references, the basis of the rejection is no more than inappropriate hindsight reconstruction using appellant's claims as a guide. *In re Warner*, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967).

What may or may not be known in general does not establish the requisite realistic motivation. *In re Deuel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995). The requisite motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. §103 is not an abstract concept, but must stem from the applied prior art as a whole and have realistically impelled one having ordinary skill in the art, at the time the invention was made, to modify a reference in a specific manner to arrive at a specifically

claimed invention with a reasonable expectation of achieving a specific benefit. *In re Newell,* 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989).

Thus a rejection under 35 U.S.C. § 102 or § 103 must fail if any claim requirement of a claim combination is not disclosed in a single prior art reference (§102) or suggested by the prior art (§ 103). The discussion below, in response to the various prior art claim rejections, points out at least one requirement of each claim, as currently presented, that is not disclosed in a single applied prior art reference or rendered obvious from the teachings of applied prior art reference combination. Favorable reconsideration is respectfully requested.

Independent claims 4, 12 and 15 as now amended all require, *inter alia*, the following:

> a moving-side optical fiber having an end thereof selectively optically connected to either of said plurality of array-side optical fibers and positioned on a respective one of said grooves. . . .

Thus, not only the array-side fibers but also the moving-side optical fiber is set on the groove to precisely fix the axes of the fibers in the same groove. Claims 2, 5 through 10, 13, 14 and 16 through 19, which depend from a respective one of these independent claims, thus also include this claim feature. Method claims 37 through 41 have been amended to include similar language. Not one of the applied references discloses the concept of positioning the movable fiber in the same groove in which the selected fiber of the array is located to fix both fibers as switched. It is submitted, therefore, that the rejections under 35 U.S.C. § 102(b) of claim 2 as anticipated by the Japanese Hotta document, of claims 12, 13, 15 and 18 as anticipated by the French Morillon document, and of claims 15 through 17 as

anticipated by U.S. patent 5,317,659 (Lee) have now been overcome. Withdrawal of these rejections is solicited.

New independent method claim 43 and dependent claim 44 have been added. Claim 43 recites, in part, "an end of a moving-side optical fiber is positioned on the groove (of the optical-fiber-arraying-member) so as to be optically connected to the array-side optical fiber." As none of the prior art references discloses or teaches this feature, it is submitted that claims 43 and 44 are allowable.

Claims 4 through 11, 14 , 19 and 37 through 41 have been rejected under 35 U.S.C. § 103(a) based on various reference combinations, *i.e.*, Hotta in view of the Japanese Nomura document, Morillon *per se*, Hotta in view of the Japanese Okubo document, Morillon in view of the Japanese Takimoto document, and Lee in view of Okubo. It is submitted that consideration of the teachings of these various combinations of references would not have provided motivation to one of ordinary skill in the art to modify the prior art devices as required by the claims as the concept of positioning both the selected array fiber and the movable fiber in the same groove is not taught in any of the references. Claims 5 through 10 additionally require that both rotation for selecting the face of the prism or pyramid and rotation for selection an array-side fiber to be optically connected within the selected face are performed. The prior art references, considered individually or in combination, do not teach this claim concept.

Claim 11 requires, *inter alia*, a pressing member having an arcuate outer periphery and having the same center as the virtual circle. The Office Action, at page 9, recognizes that the primary reference, Hotta, lacks this feature. Okubo is relied upon for teaching a pressing member of an arcuate shape and for concluding that it would have been obvious to

modify the Hotta device to provide such a pressing member. However, while the member 3 of Okubo has a circular cutout at its center to permit passage of fiber 8, its outer periphery is rectangular. It is submitted, therefore, that the reference teachings considered individually or in combination, would not have provided the artisan the requisite motivation to modify the prior art to produce the structure now recited in claim 11.

Withdrawal of the rejections of claims 4 through 11, 14 , 19 and 37 through 41 is solicited.

Method claims 25 through 29 and 31 have been rejected under 35 U.S.C. § 103 as unpatentable over either Hotta or Morillon in view of Dahlgren. Dahlgren has been relied in the Office Action upon for disclosing forming v-grooves in a fiber-holding member, thus providing a purported basis for modifying the Hotta and Morillon devices accordingly. A close review of Dahlgren, however, indicates that arcuate grooves, not v-grooves are formed by the Holgren process (see column 3, line 34 *et seq*). Column 4, lines 9-15, to which reference is made in the Office Action, does not teach v-grooves. Rather, this portion states that grooves are cut to have a width larger than the fiber cladding. Lines 22-24 of column 4 describe a generally U-shaped groove cross-section.

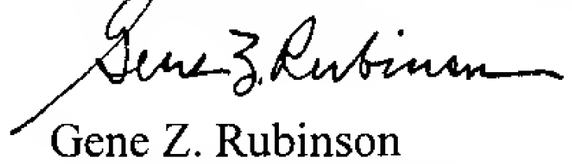
Each of claims 25 through 29 and 31 requires forming an optical fiber fixing groove. The disclosed v-shape groove provides the function of precisely fixing a fiber in place. The grooves of Dahlgren, Hotta and Morillon are round spaces that accommodate fibers but do not precisely fix the fibers. The ability to precisely fix the fibers permits a high density of grooves, formed by rotating the base material and the cutting tool in relation to each other after each cutting step to produce radial grooves. New claim 42, dependent from claim 25, expressly recites the requirement for v-grooves.

Withdrawal of the rejections of claims 25 through 29 and 31is solicited.

Accordingly, it is submitted that claims 2, 4 through 19 and 25 through 29, 31 and 38 through 44 are now allowable. Allowance of the application is respectfully solicited. To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend claims 2, 4, 5, 7, 11, 12, 15, 37, 40 and 41 as follows:

2. (Amended) The optical switch according to claim [1] 4, comprising a carrying device for carrying said moving-side optical fiber, and an arraying-member rotating device for rotating said optical-fiber-arraying-member, wherein said moving-side optical fiber is optically connected to said array-side optical fiber by said carrying device and said arraying-member rotating device.

4. (Amended) [The] An optical switch [according to claim 1, wherein] comprising:

an optical-fiber-arraying-member in which a plurality of optical fiber fixing grooves extending along radial directions of a virtual circle are radially formed in a predetermined surface of a base material;

a plurality of array-side optical fibers arrayed in said plurality of optical fiber fixing grooves of said optical-fiber-arraying-member, said array-side optical fibers [are] being arrayed so that end faces thereof are directed along directions opposite to those toward the center axis of said virtual circle;

a moving-side optical fiber having an end thereof selectively optically connected to either of said plurality of array-side optical fibers and positioned on a respective one of said grooves;

wherein said moving-side optical fiber and said optical-fiber-arraying member are rotated relative to each other about a center axis of said virtual circle to select said array-side optical fiber to be optically connected to said moving-side optical fiber.

5. (Amended) [The] An optical switch [according to claim 1, wherein] comprising:

an optical-fiber-arraying-member in which a plurality of optical fiber fixing grooves extending along radial directions of a virtual circle are radially formed in a predetermined surface of a base material;

a plurality of array-side optical fibers arrayed in said plurality of optical fiber fixing grooves of said optical-fiber-arraying-member;

a moving-side optical fiber having an end thereof selectively optically connected to either of said plurality of array-side optical fibers and positioned on a respective one of said grooves;

wherein said moving-side optical fiber and said optical-fiber-arraying member are rotated relative to each other about a center axis of said virtual circle to select said array-side optical fiber to be optically connected to said moving-side optical fiber; and

wherein said base material is of a prism shape, said plurality of optical fiber fixing grooves are radially formed in at least two side faces of said base material, said base material and said moving-side optical fiber are rotated relative to each other about a center axis of the prism to select one side face of said base material, and said moving-side optical fiber is optically connected to either of said array-side optical fibers arrayed on said one side face selected.

7. (Amended) [The] An optical switch [according to claim 1, wherein] comprising:

an optical-fiber-arraying-member in which a plurality of optical fiber fixing grooves extending along radial directions of a virtual circle are radially formed in a predetermined surface of a base material;

a plurality of array-side optical fibers arrayed in said plurality of optical fiber fixing grooves of said optical-fiber-arraying-member;

a moving-side optical fiber having an end thereof selectively optically connected to either of said plurality of array-side optical fibers and positioned on a respective one of said grooves;

wherein said moving-side optical fiber and said optical-fiber-arraying member are rotated relative to each other about a center axis of said virtual circle to select said array-side optical fiber to be optically connected to said moving-side optical fiber; and

wherein said base material is of a pyramid shape, said plurality of optical fiber fixing grooves are radially formed in at least two side faces of said base material, said base material and said moving-side optical fiber are rotated relative to each other about a center axis of the pyramid to select one side face of said base material, and said moving-side optical fiber is optically connected to either of said array-side optical fibers arrayed on said one side face selected.

11. (Amended) [The] An optical switch [according to claim 1, wherein] comprising:

an optical-fiber-arraying-member in which a plurality of optical fiber fixing grooves extending along radial directions of a virtual circle are radially formed in a predetermined surface of a base material;

a plurality of array-side optical fibers arrayed in said plurality of optical fiber fixing grooves of said optical-fiber-arraying-member;

a moving-side optical fiber having an end thereof selectively optically connected to either of said plurality of array-side optical fibers and positioned on a respective one of said grooves;

wherein said moving-side optical fiber and said optical-fiber-arraying member are rotated relative to each other about a center axis of said virtual circle to select said array-side optical fiber to be optically connected to said moving-side optical fiber; and

wherein said moving-side optical fiber comprises a plurality of optical fibers and each moving-side optical fiber is positioned on said optical-fiber-arraying-member by a pressing member [of] having an arcuate [shape] outer periphery and having the same center as said virtual circle.

12. (Amended) An optical switch comprising:

an optical-fiber-arraying-member in which a plurality of optical fiber fixing grooves are formed along a direction of a generator of a cylindrical side face of a base material, which has one of the cylindrical side surface and part of the cylindrical side surface as its own side face;

a plurality of array-side optical fibers arrayed in said plurality of optical fiber fixing grooves of said optical-fiber-arraying-member; and

a moving-side optical fiber having an end thereof to be selectively optically connected to either of said plurality of array-side optical fibers and positioned on a respective one of said grooves;

wherein said moving-side optical fiber and said optical-fiber-arraying member are rotated relative to each other about a center axis of said cylinder and said moving-side optical fiber is optically connected to said array-side optical fiber.

15. (Amended) An optical switch comprising:

an optical-fiber-arraying-member in which a plurality of optical fiber fixing grooves are formed along a direction of a generator of a conical side face of a base material, which has one of the conical side face and part of the conical side face as its own side face;

a plurality of array-side optical fibers arrayed in said plurality of optical fiber fixing grooves of said optical-fiber-arraying-member; and

a moving-side optical fiber having an end thereof to be selectively optically connected to either of said plurality of array-side optical fibers and positioned on a respective one of said grooves;

wherein said moving-side optical fiber and said optical-fiber-arraying member are rotated relative to each other about a center axis of said cylinder and said moving-side optical fiber is optically connected to said array-side optical fiber.

37. (Amended) A method of arraying optical fibers, comprising:

a step of preparing an optical-fiber-arraying-member in which a plurality of optical fiber fixing grooves extending along radial directions of a virtual circle are radially formed in a predetermined surface of a base material;

a step of arraying and fixing a plurality of array-side optical fibers to be optically connected to a moving-side optical fiber, in said plurality of optical fiber fixing grooves, wherein an edge of the moving-side optical fiber is positioned in a respective one of said grooves; and

a step of rotating a cylindrical edge of a cylindrical shape about a center axis of said virtual circle to cut ends of said plurality of array-side optical fibers to align the ends.

40. (Amended) A method of arraying optical fibers, comprising:

a step of preparing an optical-fiber-arraying-member in which a plurality of optical fiber fixing grooves extending along a direction of a generator of a cylindrical side face of a base material, which has one of the cylindrical side face and part of the cylindrical side face as its own [won] side face, are formed in parallel to each other;

a step of arraying and fixing a plurality of array-side optical fibers to be optically connected to a moving-side optical fiber, in said plurality of optical fiber fixing grooves, wherein an edge of the moving-side optical fiber is positioned in a respective one of said grooves; and

a step of rotating a rotary blade having a rotation axis parallel to a center axis of said cylinder and rotating said base material and said rotary blade relative to each other

about the center axis of said cylinder, thereby cutting ends of said plurality of array-side optical fibers to align the ends.

41. (Amended) A method of arraying optical fibers, comprising:

a step of preparing an optical-fiber-arraying-member in which a plurality of optical fiber fixing grooves extending along directions of a generator of a conical side face of a base material, which has one of the conical side face and part of the conical side face as its own side face, are formed;

a step of arraying and fixing a plurality of array-side optical fibers to be optically connected to a moving-side optical fiber, in said plurality of optical fiber fixing grooves, wherein an edge of the moving-side optical fiber is positioned in a respective one of said grooves; and

a step of rotating a rotary blade having a rotation axis parallel to a center axis of said cone and rotating said base material and said rotary blade relative to each other about the center axis of said cone, thereby cutting ends of said plurality of array-side optical fibers to align the ends.